What is claimed is:

1. A discharge power supply apparatus for supplying a direct current voltage to a discharge load and discharging the same, comprising:

an inverter circuit that converts direct current voltage to alternating current voltage;

a full-wave rectifier circuit that has a plurality of diodes and rectifies an alternating current voltage generated by said inverter circuit; and

a trigger capacitor connected in parallel to a portion of said diodes of said full-wave rectifier circuit,

wherein, at the start of the discharge of said discharge load, a trigger voltage that is higher than a stationary output voltage is supplied to the discharge load, and after the start of the stationary discharge, the direct current voltage output by said full-wave rectifier circuit is supplied to said discharge load.

2. A discharge power supply apparatus according to claim 1, wherein said full-wave rectifier circuit is a full-bridge rectifier circuit including two serially connected pairs of diodes, and the trigger capacitor is connected in parallel to any one of the pairs of said diodes.

3. A discharge power supply apparatus according to claim 1, further comprising a transformer having a primary winding, to which the alternating current voltage output by said inverter circuit is supplied, and a secondary winding.

4. A discharge power supply apparatus according to claim 3, wherein said transformer

has two of said secondary windings, said two secondary windings are connected together serially, said full-wave rectifier circuit is a center tap rectifier circuit, said center tap rectifier circuit is connected to said two secondary windings, and said trigger capacitors are charged up to a voltage equal to the sum of the voltages generated by said two secondary windings.

5. A discharge power supply apparatus according to claim 1, wherein, if the leakage current flowing through said discharge load before the start of the discharge is denoted It(A), the stationary discharge voltage is denoted E(V), and the frequency of the alternating current voltage output by said inverter circuit is denoted F(Hz), then the capacitance C(F) of said trigger capacitor is C>It/(E×F), and the capacitance C(F) is equal to or less than the capacitance at which full-wave rectification is carried out when said discharge load is in the stationary discharge state.

6. A discharge power supply apparatus according to claim 2, wherein, if the leakage current flowing through said discharge load before the start of the discharge is denoted It(A), the stationary discharge voltage is denoted E(V), and the frequency of the alternating current voltage output by said inverter circuit is denoted F(Hz), then the capacitance C(F) of said trigger capacitor is C>It/(2×E×F), and the capacitance C(F) is equal to or less than the capacitance at which full-wave rectification is carried out when said discharge load is in the stationary discharge state.

7. A discharge power supply apparatus according to claim 1, wherein capacitors are respectively connected in parallel to all of the diodes in said rectifier circuit, and one of the capacitors is a trigger capacitor that has an electrostatic capacitance that is

substantially larger than that of the other capacitors.

8. A discharge power supply apparatus according to claim 1, wherein the diodes of said rectifier circuit comprise a plurality of diodes connected serially, capacitors are respectively connected in parallel to the plurality of serially connected diodes, and a portion of the capacitors among these capacitors are trigger capacitors having a capacitance substantially larger than the other capacitors.

9. A discharge power supply apparatus according to claim 7, wherein, if the leakage current flowing through said discharge load before the start of the discharge is denoted It(A), the stationary discharge voltage is denoted E(V), and the frequency of the alternating current voltage output by said inverter circuit is denoted F(Hz), then the capacitance of said trigger capacitor is greater than the capacitance of the other capacitors by It/(E×F) or more, and is equal to or less than the capacity that carries out a full-wave rectification when said discharge load is in the stationary discharge state.

10. A discharge power supply apparatus according to claim 3, wherein said inverter circuit is a multi-phase inverter, said transformer is a multi-phase transformer having a plurality of primary windings and secondary windings, and said rectifier circuit is a multi-phase rectifier circuit having a plurality of diode arms.

11. A discharge power supply apparatus for supplying a direct current voltage to a discharge load and discharging the same, comprising:

an inverter circuit that converts direct current voltage to alternating current voltage;

a full-wave rectifier circuit that rectifies an alternating current voltage generated by said inverter circuit;

a trigger capacitor and a trigger diode is connected in series between the input side and the output side of said full-wave rectifier circuit; and

a charging diode connected between the input side of said full-wave rectifier circuit and the junction of said trigger capacitor and said trigger diode,

wherein, at the start of the discharge, the voltage of said trigger capacitor is superimposed on the voltage of said secondary winding to supply to the discharge load a trigger voltage that is higher than the stationary output voltage, and after the start of the stationary discharge, a direct current power output from said full-wave rectifier circuit is supplied to said discharge source.

12. A discharge power supply apparatus according to claim 11, wherein a smoothing capacitor or a smoothing capacitor and a bypass diode are provided at the output of said full-wave rectifier circuit, and the cathode of said trigger diode and the cathode of said bypass diode are connected.

13. A discharge power supply apparatus according to claim 11, further comprising a transformer having a primary winding, to which the alternating current voltage output by said inverter circuit is applied, and a secondary winding.

14. A discharge power supply apparatus according to claim 13, wherein said transformer has two connected serially secondary windings, said full-wave rectifier circuit is a center tap rectifier circuit comprising a pair of diodes connected serially to each of the terminals of said two secondary windings, and said charging diode is

connected between the junction of said two connected serially secondary windings and the junction of said trigger capacitor and said trigger diode.

15. A discharge power supply apparatus according to claim 13, wherein said transformer has two connected serially secondary windings, said full-wave rectifier circuit is a center tap rectifier circuit comprising a pair of diodes connected serially to each of the terminals of said two secondary windings, and said charging diode is connected between the other terminal of said two connected serially secondary windings and the junction between said trigger capacitor and said trigger diode.

16. A discharge power supply apparatus according to claim 11, wherein the capacitance C(F) of said capacitors has values that satisfy the formula:

$$C>It/(F\times E)$$

where It(A) denotes the discharge current before the start of the discharge, E(V) denotes the discharge voltage of the stationary discharge state, and F(Hz) denotes the converted frequency of the inverter circuit, and the capacitance C(F) is equal to or less than the capacity for carrying out full-wave rectification when said discharge load is in the stationary discharge state.